

What is claimed is:

1. A HMM modifying method, comprising the steps of:
  - a) performing Viterbi decoding for pattern  
5 classification;
  - b) calculating misclassification measure using discriminant function;
  - c) obtaining modified misclassification measure for a weighted loss function;
  - 10 d) computing a delta coefficient according to the obtained misclassification measure;
  - e) modifying HMM weight according to the delta coefficient; and
  - f) transforming classifier parameters for satisfying  
15 a limitation condition.

2. The method as recited in claim 1, wherein the weighted loss function  $\bar{d}_i(X;\Lambda)$  is defined as:

$$\begin{aligned}\bar{d}_i(X;\Lambda) &= d_i(X;\Lambda) - k \cdot g_i(X;\Lambda) \\ &= -(1+k) \cdot g_i(X;\Lambda) + \log \left[ \frac{1}{N} \sum_{j=1, j \neq i}^N \exp[g_j(X;\Lambda)\eta] \right]^{\frac{1}{\eta}}\end{aligned}$$

- 20 , wherein  $i$  and  $j$  is positive integer number and  $i$  representing a number of class,  $g_i(X;\Lambda)$  is the discriminant function for class  $i$  with  $\Lambda$  being a set of classifier parameters and  $X$  is an observation sequence,  $N$  is an integer number representing class models and  $k$  is positive  
25 number representing the number of HMM state.

3. The method as recited in claim 1, wherein the delta coefficient  $\Delta w_i$  is obtained based on the discriminant function and the weighted loss function defined as:

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$$\Delta w_i = \frac{d_i(X; \Lambda)}{-g_i(X; \Lambda)} ,$$

wherein  $d_i(X; \Lambda)$  is the weighted loss function and  $g_i(X; \Lambda)$  is the discriminant function,  $\Lambda$  is a set of classifier parameters,  $X$  is an observation sequence,  $i$  is positive integer number representing a number of class.

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4. The method as recited in claim 1, wherein in the step f), the classifier parameter is transformed by the limitation condition, which a summation of HMM weights in a HMM set is limited to a total number of HMM in the HMM set, which is defined as:

$$\sum_{i=1}^M w_i = M, \quad 0 < w_i < M ,$$

wherein  $M$  is positive integer number representing the number of HMM.

20 5. The method as recited in claim 1, wherein in the step a), the discriminant function is obtained by a viterbi decoding.